Marignac I have been enabled to compare a specimen of Yα of his own preparation with the earth described above. The two earths agree in their chemical characteristics, and their phosphorescent spectra are practically identical.

No name has yet been given to this earth, as M. de Marignac appears to be in some doubt whether it is not identical with J. Lawrence Smith's earth mosandra.* A specimen of mosandra prepared by J. Lawrence Smith, and sent me by M. de Marignac, gave a phosphorescent spectrum showing that it was compound, and that yttria was one of its constituents.

*March* 4, 1886.

Professor G. G. STOKES, D.C.L., President, in the Chair.

The Presents received were laid on the table and thanks ordered for them.

In pursuance of the Statutes, the names of the Candidates recommended for election into the Society were read from the Chair, as follows:—

Atkinson, Prof. Edmund, Ph.D.
Bidwell, Shelford, M.A.
Bosanquet, Robert Halford Macdowall, M.A.
Boys, Charles Vernon, A.R.S.M.
Buchanan, John Young, M.A.
Burdett, Henry Charles, F.S.S.
Buzzard, Thomas, M.D.
Cameron, Sir Charles Alexander, M.D.
Cash, J. Theodore, M.D.
Claudet, Frederic, F.C.S.
Colenso, William, F.L.S.
Corfield, Prof. William Henry, M.D.
Curtis, Arthur Hill, D.Sc.
Davis, James William, F.G.S.
Denton, John Bailey, M.I.C.E.
Dixon, Harold B., M.A.
Douglass, Sir James Nicholas, M.I.C.E.
Ewart, Professor J. Cossar, M.D.
Ewing, Professor J. A., B.Sc.
Festing, Edward Robert, Major-General, R.E.
Forbes, Professor George, M.A.
Forsyth, Andrew Russell, M.A.
Foster, Professor Balthazar Walter, F.R.C.P.
Galloway, William.
Gowers, William Richard, M.D.
Green, Professor A. H., M.A.
Hinde, George Jennings, Ph.D.
Horsley, Prof. Victor, F.R.C.S.
Latham, Peter Wallwork, M.D.
Lewis, Timothy Richards, M.B., Surgeon-Major, A.M.D.
MacGillivray, Paul Howard, M.A.
Manson, Patrick, M.D.
Meldola, Raphael, F.R.A.S.
Milne, Professor John, F.G.S.
Moxon, Walter, M.D.
Ord, William Miller, M.D.

* "Comptes rendus," lxxxvii, p. 145; lxxxvii, p. 831; lxxxix, p. 480.

Palmer, Henry Spencer, Colonel R.E.
Pickard-Cambridge, Rev. Octavius, M.A.
Poynting, Prof. John Henry, B.Sc.
Pritchard, Urban, M.D.
Pye-Smith, Philip H., M.D.
Ramsay, Professor William, Ph.D.
Rodwell, George F., F.R.A.S.
Russell, Henry Chamberlaine, B.A.
Sanders, Alfred, F.L.S.
Sedgwick, Adam, M.A.
Snelus, George James, F.C.S.
Sollas, Professor William Johnson, D.Sc.
Stevenson, Thomas, M.D.
Tate, Professor Ralph, F.G.S.
Teale, Thomas Pridgin, F.R.C.S.
Tenison-Woods, Rev. Julian E., M.A.
Tidy, Prof. Charles Meymott, M.B.
Tonge, Morris, M.D.
Topley, William, F.G.S.
Unwin, Prof. W. Cawthorne, B.Sc.
Warington, Robert, F.C.S.
Wharton, William James Lloyd, Captain R.N.
Whitaker, William, B.A.
White, William Henry.
Wilde, Henry.
Wright, Professor Edward Perceval, M.A.

The Bakerian Lecture was then delivered as follows:—

I. The Bakerian Lecture.—"Colour Photometry." By Captain Abney, R.E., F.R.S., and Major-General Festing, R.E.

(Abstract.)

One of the authors of this paper has already communicated to the Physical Society of London ("Phil. Mag.," 1885) a method by which a patch of monochromatic light could be thrown on a screen. This formed the starting point of the present investigation, which was to ascertain whether it was practicable to compare with each other the intensity of lights of different colours.

The authors describe various plans they adopted to effect this purpose, and finally found that by placing a rod in front of the patch of monochromatic light, and of a candle by casting another shadow, the intensities of the two lights could be compared by what they term an oscillation method. It is known that on each side of the yellow of the spectrum the luminosity more or less rapidly decreases. By placing a candle at such a distance from the screen that the luminosity of the two shadows appears as approximately equal, it is easy to oscillate the card carrying the slit through which the monochromatic rays of the spectrum pass. (The slit is in the focus of the lens which helps to form the spectrum.) The shadow of the rod cast by the candle can thus be made to appear alternately "too light" or "too dark" in comparison with the shadow of the rod cast by the parts of the spectrum falling on the screen. By a rapid oscillation the position of equality

of the two shadows can be distinguished with great exactness. The authors describe their method of fixing the position of the rays employed and the source of light with which the spectrum is formed. They also enter into details as to the comparison light, the receiving screen, and the comparative value of the light as seen by them respectively. The curve of the intensity of the arc light spectrum, as seen by their eyes, which they call the normal curve, is then described. The question as to the effect of an alteration of the colour of the comparison light is then discussed, as is the effect of the brightness of the spectrum.

The next point touched upon is as to the value of mixed light as compared with its components. It is found that the following law holds good, viz.: *that "the sum of the intensities of two or more colours is equal to the intensity of the same rays when mixed."* This law is applied to Hering's theory of colour.

The authors next state that with the majority of people the curve of luminosity of the spectrum is identical with the normal curve, but that in some cases slight differences may be observed, of which one example is given. Such slight deficiency does not constitute colour-blindness, since the want of appreciation of any colour is but very partial. They next describe observations made by four colour-blind persons, and show that there is a remarkable divergence in their curves from the normal. The deficiency curves are shown, from which it appears that two of the observers are totally blind to red, whilst the other two are partially so. They then show that such observers would not give a true value for any light which is not of identically the same colour as the comparison light they might employ. It also appears that the intensity of illumination felt by a colour-blind is really less than that perceived by a normal-eyed person.

Two examples of the normal curve for sunlight are then given, one taken on a day in July by the method of separating close lines by means of varying illumination, and the other in November, by the method adopted by the authors. Their results are compared with Vierordt's curve, obtained by extinguishing colour with white light.

In order to ascertain the effect of the turbidity of a medium through which light passes (for instance sunlight), the authors compared the intensity of the spectrum after passing through clear water and turbid water, and found that the absorption agreed with Lord Rayleigh's theoretical deductions that $I' = I_0 \epsilon^{-kx\lambda^{-4}}$, where $I'$ is the intensity after passing through a turbid medium, $I_0$ the intensity after passing through clear water, $x$ the thickness of the turbid layer, $k$ a constant independent of $\lambda$, $\lambda$ being the wave length.

The authors conclude their paper with a discussion of the intensity of incandescence of carbon electrically heated.